



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2012-0913; Directorate Identifier 2012-NE-23-AD]

RIN 2120-AA64

Airworthiness Directives; Honeywell International Inc. Turboprop Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We propose to adopt a new airworthiness directive (AD) for certain Honeywell International Inc.

TPE331-5, -5A, -5AB, -5B, -10, -10R, -10U, -10UF, -10UG, -10UGR, and -10UR model turboprop engines. This proposed AD was prompted by engine propeller shaft coupling failures, leading to unexpected propeller pitch changes resulting in high aerodynamic and asymmetric drag on the airplanes using these engines. This proposed AD would require removing certain part number (P/N) propeller shaft couplings from service. This proposed AD would also require inserting a copy of Honeywell International Inc. Operating Information Letter OI331-26, dated March 2, 2010, into the applicable Airplane Flight Manuals. We are proposing this AD to prevent loss of airplane control, leading to an accident.

DATES: We must receive comments on this proposed AD by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this proposed AD, contact Honeywell International Inc., 111 S. 34th Street, Phoenix, AZ 85034-2802; phone: 800-601-3099; Web site: <http://portal.honeywell.com>. You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2012-0913; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Joseph Costa, Aerospace Engineer, Los Angeles Aircraft Certification Office, FAA, Transport Airplane Directorate, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: joseph.costa@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section.

Include “Docket No. FAA-2012-0913; Directorate Identifier 2012-NE-23-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

Discussion

We have received numerous reports of propeller shaft couplings, P/Ns 3107065-1 and 865888-3, failing. These propeller shaft couplings experience fatigue cracks at the corners of the lubrication slots that may result in separation and fragmentation of the propeller shaft coupling. That separation causes a sudden loss of drive torque from the engine’s power section to the propeller shaft (called drivetrain uncoupling). After a drivetrain uncoupling, the engine’s fuel pump continues to provide fuel to the power section, and with no propeller load and no engine control changes by the pilot, the engine power section will accelerate to the fuel control’s overspeed governor set point. Even though the propeller drive is uncoupled, the propeller blade pitch is still controlled by the propeller governor. During this overspeed condition, the propeller governor is designed to move the propeller blades toward higher pitch until full feather is reached with the propeller not rotating or rotating very slowly. Under certain conditions the power section will remain at about 104% RPM with the propeller blades in feather position and the propeller not rotating or rotating very slowly, until the engine is shut down by the pilot.

Potential Unsafe Failure Scenarios

After a propeller shaft drivetrain uncoupling, the speed of the engine's power section may be reduced: (1) from full power, by the pilot retarding the power lever to flight idle, which reduces fuel to the power section; (2) at flight idle, because the fuel control reduces the fuel supply to the power section and/or; (3) by fragmentation of the propeller shaft coupling and secondary damage to the gears in the gearbox. If the resulting speed of the power section falls below the propeller governor set point (set by the pilot-controlled condition lever), the propeller governor will move the propeller out of feather to a low-pitch, high-drag position.

Also, after a propeller shaft drivetrain uncoupling, a pilot reacting to the overspeed of the power section may inadvertently retard the power lever to flight idle. Doing so will cause the propeller governor to move the feathered propeller to a low-pitch, high-drag condition.

Several reports during maintenance test flights and in-service operations of twin-engine airplanes have shown that inadvertent movement of the propeller blade pitch to a low blade angle create a high aerodynamic and asymmetric drag with resultant uncommanded yaw and roll response on the airplane. Following this unexpected yaw and roll response, stabilization and control of the airplane may range from unusually difficult to catastrophic, and pilots may lack sufficient time to properly assess the engine problem, initiate an engine emergency shutdown, and activate the feather valve.

The drivetrain uncoupling events described previously lead to loss of thrust, cause the propeller blade pitch to go to a low-blade angle, and create a high aerodynamic and asymmetric drag on the airplane. The low-blade angle may result in loss of airplane control, leading to an accident. After a review of about 40 years of National Transportation Safety Board fatal accident reports of multi-engine airplanes with TPE331 engines, we determined that certain airplanes are more at risk by engine-failure events

than others. Therefore, we are proposing compliance times in this AD that address the risk by airplane after a propeller shaft coupling failure.

Relevant Service Information

Allied-Signal Aerospace Company, Garrett Engine Division Service Bulletin No. TPE331-72-0873, Revision 1, dated May 20, 1993, describes procedures for replacing the affected P/Ns of propeller shaft couplings with a defined redesigned propeller shaft coupling.

Honeywell International Inc. Operating Information Letter OI331-26, dated March 2, 2010, describes emergency procedures for aircrew if a propeller shaft coupling fails.

FAA's Determination

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements

This proposed AD would require removing propeller shaft couplings, P/Ns 3107065-1, 865888-3, 865888-6, and 865888-8, from service.

This proposed AD would also require inserting a copy of Honeywell International Inc. Operating Information Letter OI331-26, dated March 2, 2010, into the applicable Airplane Flight Manual, Pilot Operating Handbook, or Manufacturer's Operating Manual.

Costs of Compliance

We estimate that this proposed AD would affect 485 engines installed on airplanes of U.S. registry. We also estimate that it would take about one hour per engine to perform the actions required by this proposed AD, if done at next turbine hot section scheduled inspection, and 40 hours per engine if done at an unscheduled access of the

propeller shaft coupling. We also estimate that 400 engines would have the replacement actions done at a scheduled time of next turbine hot section inspection, and 85 engines would have the replacement actions done at an unscheduled access of the propeller shaft coupling. We also estimate that the average labor rate is \$85 per hour. Required parts would cost about \$12,000 per engine. Based on these figures, we estimate the total cost of the proposed AD to U.S. operators to be \$6,143,000.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),

(3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and

(4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

Honeywell International Inc. (Type Certificate previously held by AlliedSignal Inc., Garrett Engine Division; Garrett Turbine Engine Company; and AiResearch Manufacturing Company of Arizona): Docket No. FAA-2012-0913; Directorate Identifier 2012-NE-23-AD.

(a) Comments Due Date

We must receive comments by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to Honeywell International Inc. TPE331-5, -5A, -5AB, -5B, -10, -10R, -10U, -10UF, -10UG, -10UGR, and -10UR model turboprop engines, with a propeller shaft coupling, part number (P/N) 3107065-1, 865888-3, 865888-6, or 865888-8, installed.

(d) Unsafe Condition

This AD was prompted by engine propeller shaft coupling failures leading to unexpected propeller pitch changes resulting in high aerodynamic and asymmetric drag on the airplanes using these engines. We are issuing this AD to prevent loss of airplane control, leading to an accident.

(e) Compliance

Comply with this AD within the compliance times specified, unless already done.

(1) Engines Installed In Mitsubishi MU-2B Series (MU-2 Series) Airplanes

Remove from service the affected propeller shaft coupling at the earliest of the following:

- (i) Next piece-part exposure; or
- (ii) Next turbine (hot) section inspection (HSI); or
- (iii) Before accumulating an additional 1,200 cycles after the effective date of this

AD.

(2) Engines Installed In Construcciones Aeronauticas, S.A. (CASA) C-212 Series, and Twin Commander 690 and 695 Series (Jetprop Commander) Airplanes

Remove from service the affected propeller shaft coupling at the earliest of the following:

- (i) Next piece-part exposure; or
- (ii) Next turbine HSI; or
- (iii) Before accumulating an additional 2,400 cycles after the effective date of this

AD.

(3) Engines Installed In British Aerospace Jetstream 3101 Series, Dornier Luftfahrt Dornier 228 Series, and M7 (formerly Fairchild, Swearingen) SA226 and SA227 Series Airplanes, and All Other Airplanes Not Listed in this AD Using Affected Engines

Remove from service the affected propeller shaft coupling at the earliest of the following:

(i) Next piece-part exposure; or

(ii) Next turbine HSI; or

(iii) Before accumulating an additional 3,600 cycles after the effective date of this AD.

(4) Inserting a Copy of Honeywell International Inc. Operating Information Letter into the FAA-Approved Flight Manual

Within 60 days after the effective date of this AD, for airplanes with engine propeller shaft coupling, P/N 3107065-1, 865888-3, 865888-6, or 865888-8, installed, insert a copy of Honeywell International Inc. Operating Information Letter OI331-26, dated March 2, 2010, into the Emergency Procedures Section of the applicable Airplane Flight Manual, Pilot Operating Handbook, or Manufacturer's Operating Manual.

(f) Definition

For the purpose of this AD, next piece-part exposure is when the nose cone assembly is removed from the engine.

(g) Installation Prohibition

After the effective date of this AD, do not install any propeller shaft coupling, P/N 3107065-1, 865888-3, 865888-6, or 865888-8, into any engine.

(h) Alternative Methods of Compliance (AMOCs)

The Manager, Los Angeles Aircraft Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request.

(i) Related Information

(1) For more information about this AD, contact Joseph Costa, Aerospace Engineer, Los Angeles Aircraft Certification Office, FAA, Transport Airplane Directorate, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: joseph.costa@faa.gov.

(2) Allied-Signal Aerospace Company Service Bulletin No. TPE331-72-0873, Revision 1, dated May 20, 1993, addresses acceptable replacement parts, and other information pertaining to the subject of this AD.

(3) For service information identified in this AD, contact Honeywell International Inc., 111 S. 34th Street, Phoenix, AZ 85034-2802; phone: 800-601-3099; Web site: <http://portal.honeywell.com>.

(4) You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Issued in Burlington, Massachusetts, on May 6, 2014.

Colleen M. D'Alessandro,
Assistant Directorate Manager, Engine & Propeller Directorate,
Aircraft Certification Service.

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